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The Impact of Various Feeding Strategies on Growth Performance and Carcass Dressing Percentage

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Introduction:

Poorly digestible, high fibre diets and ad libitum feeding levels have been shown to increase the weight of visceral organs and gutfill, thereby reducing carcass dressing percentage (King, 1990; Hansen et al., 1992; Pluske et al., 1998). Additionally, visceral organs are metabolically active tissues that contribute to the inefficiency of converting dietary nutrients into edible pork products (Kelly et al., 1993). As suggested by Nyachoti (1998), metabolic activity in gutfill and visceral organs is closely related to their size. Feeding diets of higher digestibility and reducing feed intake levels immediately prior to slaughter may reduce visceral organ weight in slaughter weight pigs. This may enable a redistribution of protein present in visceral organs into lean body tissue (Ferrell et al., 1986; Ferrell and Koong, 1986). In order for such feeding strategies to be implemented in practical production systems, the practicality and economic feasibility of pre-slaughter feeding regimens must be determined. A series of experiments were conducted to determine the impact of diet composition, and pre-slaughter feeding level on growth performance and aspects of carcass and meat quality in pigs.

Objectives:

1. To determine how growth performance in finishing pigs is influenced by diet composition and feeding level.
2. To establish the impact of diet composition, and feeding level on carcass dressing percentage.

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Methodology:

A recent study conducted at the University of Guelph, Ponsonby Research Station, investigated growth performance using 96 grower/finisher pigs. Pigs (48 gilts, 48 barrows) were randomly assigned (4 pigs per pen, split sex) to a typical barley-canola meal-based ration (BCM) or a corn-soybean meal-based ration (CSM), formulated to meet or exceed NRC (1998) requirements. Each diet was fed ad libitum until the pigs reached approximately 95 kg BW. Once the average body weight (BW) of the pigs in a pen reached 95 kg BW, each pen was randomly allocated to a sub-treatment. Pigs on each of the BCM and CSM rations either remained on an ad libitum feeding level

of their respective diets, were restricted to 2 kg/pig/day, or were fed semi-ad libitum, a highly digestible casein-cornstarch-based diet. When the average BW of the pigs in a pen exceeded 105 kg, pigs were slaughtered.

Results:

In the study, average daily gain (ADG), feed conversion (gain:feed), and average daily digestible energy intake (ADEI) were measured during two growth periods (Tables 1 and 2). Additionally, carcass measurements, which included hot carcass weight, dressing percentage, lean yield, and loin eye area were made once the pigs were slaughtered (Table 3).

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Table 1

Growth Period 1: (Approximately 48-95 kg body weight)

Treatments ¹	# pigs	Initial BW (kg)	Final BW (kg)	Feed Intake (g/d)	ADEI ² (MJ/d)	ADG (g/d)	Gain:Feed (g/kg)
BCM - ad libitum	48	46.4	90.4	2802	35.7	961	343a,3
CSM - ad libitum	48	46.9	91.1	2503	36.2	1021	403b

¹BCM = barley canola meal; CSM = corn soybean meal.

²ADEI = average daily digestible energy intake.

³Values within columns with differing superscripts (a,b) are different ($P < 0.05$).

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Table 2

Growth Period 2: (Approximately 95-105 kg body weight)

Treatments ¹	# pigs	Initial BW (kg)	Final BW (kg)	Feed Intake (g/d)	ADEI ² (MJ/d)	ADG (g/d)	Gain: Feed (g/kg)
BCM - ad libitum	15	87.3	103.9	3407	43.4c	887ab	251a
BCM - limit fed	16	96.7	100.9	2222	28.3b	712b	286a
BCM - casein	16	92.1	105.1	4216	53.7a	1066a	301ab
CSM - ad libitum	16	90.1	103.6	3431	43.7c	940ab	310ab
CSM - limit fed	16	95.1	103.6	2355	30.0b	881ab	381b
CSM - casein		93.2	105.7	4295	54.7a	1064a	294a

¹BCM = barley canola meal; CSM = corn soybean meal; Casein = casein-cornstarch - a highly digestible semi-synthetic diet; ad libitum = unlimited intake; limit fed=2kg/pig/day.

²ADEI = average daily digestible energy intake.

³Values within columns with differing superscripts (a,b,c) are different ($P < 0.05$).

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Table 3

Carcass Measurements of Pigs Subjected to Various Feeding Strategies

Treatments ¹	# pigs	Final BW (kg)	Hot Carcass Weight ² (kg)	Carcass Dressing (%)	Lean Yield (%)	Loin Eye Area (cm ²)
BCM - ad libitum	15					
BCM - limit fed	16	103.9	80.1c,3	77.6c	61.5	45.0
BCM - casein	16	100.9	80.9bc	78.5bc	61.5	44.8
CSM - ad libitum	16	105.1	81.7abc	79.1abc	60.5	44.0
CSM - limit fed	16	103.6	83.3a	80.7a	61.0	44.8
CSM - limit fed	16	103.6	81.3abc	78.7abc	60.8	45.7
CSM - casein	16	105.7	83.0a	80.4ab	60.6	46.3

1BCM = barley canola meal; CSM = corn soybean meal; Casein = casein-cornstarch - a highly digestible semi-synthetic diet; ad libitum = unlimited intake; limit fed=2kg/pig/day.

2Hot Carcass Weight is taken at the time of slaughter, and is the weight of the carcass with leaf fat, head and front feet included.

3Values within columns with differing superscripts (a,b,c) are different (P < 0.05).

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Summary and Conclusions:

1. Feeding casein affects ADEI, when compared to pigs fed BCM or CSM, at either feeding level. ADEI and ADG is similar in finishing pigs fed ad libitum BCM or CSM.
2. BCM-fed pigs are less efficient converters than pigs fed CSM. This is due to differences in energy density between BCM and CSM.
3. Feeding CSM results in a higher carcass dressing % than BCM.
4. Carcass dressing % may be improved in pigs fed BCM by restricting feed intake to 2 kg/pig/day or by feeding ad libitum a highly digestible diet during the last 2 weeks prior to slaughter. These changes in feeding strategy do not increase carcass dressing percentage in pigs fed typical CSM diets.
5. Using alternative feeding strategies as a means of increasing carcass dressing % will not influence meat and carcass characteristics.

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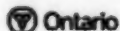
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